

LAKE WENTWORTH

2019 SAMPLING HIGHLIGHTS

Station – 12 Governors

Wolfeboro, NH



Extension

This report provides a water quality overview for data collected in Lake Wentworth, Site 12 Governors, between 1987 and 2019. Water quality data displayed in Tables 1, 2 and 3 are surface water measurements with the exception of the dissolved oxygen data that summarize conditions near the lake bottom.

Blue = Excellent =
Oligotrophic

Yellow = Fair =
Mesotrophic

Red = Poor = Eutrophic

Gray = No Data

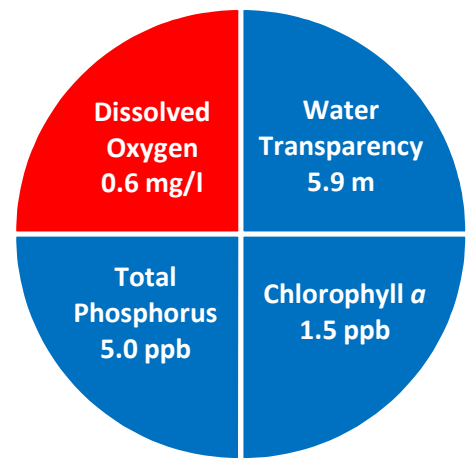


Figure 1. Lake Wentworth Water Quality (2019)

Table 1. 2019 Lake Wentworth Seasonal Averages and NH DES Aquatic Life Nutrient Criteria¹

Parameter	Oligotrophic "Excellent"	Mesotrophic "Fair"	Eutrophic "Poor"	Lake Wentworth Site 12 Governors Average (range)	Site 12 Governors Classification
Water Clarity (meters)	4.0 – 7.0	2.5 - 4.0	< 2.5	5.9 meters (5.0 – 7.1)	Oligotrophic
Chlorophyll <i>a</i> ¹ (ppb)	< 3.3	> 3.3 – 5.0	> 5.0 – 11.0	1.5 ppb (0.7 – 2.0)	Oligotrophic
Total Phosphorus ¹ (ppb)	< 8.0	> 8.0 – 12.0	> 12.0 – 28.0	5.0 ppb (single value)	Oligotrophic
Dissolved Oxygen (mg/L)	5.0 – 7.0	2.0 – 5.0	<2.0	0.6 mg/l (range: 0.0 – 1.3)	Eutrophic

* Dissolved oxygen concentrations were measured on August 16, 2019 between 12.0 and 19.0 meters, in the bottom waters.

Table 2. 2019 Lake Wentworth Seasonal Average Accessory Water Quality Measurements

Parameter	Assessment Criteria					Lake Wentworth Site 12 Governors Average (range)	Site 12 Governors Classification
Color (color units)	< 10 uncolored	10 – 20 slightly colored	20 – 40 lightly tea colored	40 – 80 tea colored	> 80 highly colored	14.9 color units (range: 10.7 – 17.9)	Slightly tea colored
Alkalinity (mg/L)	< 0.0 acidified	0.1 – 2.0 extremely vulnerable	2.1 – 10 moderately vulnerable	10.1 – 25.0 low vulnerability	> 25.0 not vulnerable	6.3 mg/L (range: 6.0 – 6.6)	Moderately vulnerable
pH (std units)	< 5.5 suboptimal for successful growth and reproduction		6.5 – 9.0 optimal range for fish growth and reproduction			7.2 standard units (single value)	Optimal range for fish growth and reproduction
Specific Conductivity (uS/cm)	< 50 uS/cm Characteristic of minimally impacted NH lakes		50-100 uS/cm Lakes with some human influence	> 100 uS/cm Characteristic of lakes experiencing human disturbances		70.9 uS/cm (single value)	Characteristic of lakes with some human influence

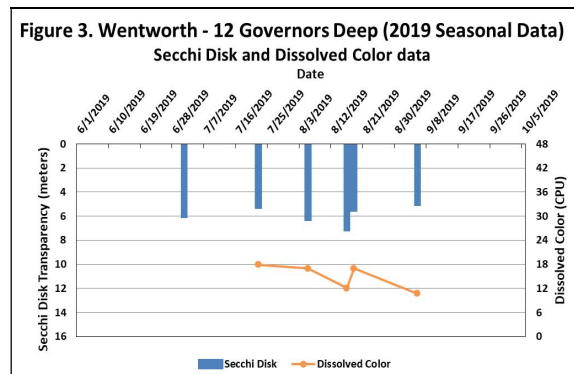
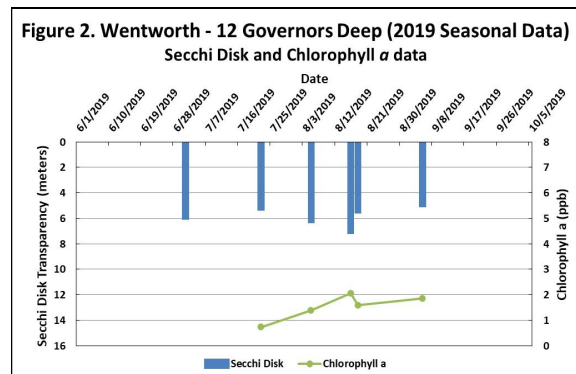


Figure 2 and 3. Seasonal Secchi Disk transparency, chlorophyll *a* changes and dissolved color concentrations. Figures 2 and 3 illustrate the interplay among Secchi Disk transparency, chlorophyll *a* and dissolved color. Shallower water transparency measurements oftentimes correspond to increases in chlorophyll *a* and/or color concentrations.

LONG-TERM TRENDS – SITE 12 GOVERNORS

WATER CLARITY: The Lake Wentworth water clarity measurements, measured as Secchi Disk transparency, display a trend of decreasing water transparency between 1987 and 2019 (Figure 4).

CHLOROPHYLL: The Lake Wentworth chlorophyll *a* concentrations, a measure of microscopic plant life within the lake, display a trend of decreasing concentrations between 1987 and 2019 (Figure 4).

TOTAL PHOSPHORUS: Phosphorus is the nutrient most responsible for microscopic plant growth. The Lake Wentworth total phosphorus concentrations display a trend of decreasing concentrations between 1987 and 2019 (Figure 5).

COLOR: The Lake Wentworth color data, the result of naturally occurring “tea” color substances from the breakdown of soils and plant materials, display a relatively stable trend between 1987 and 2019 (Figure 5).

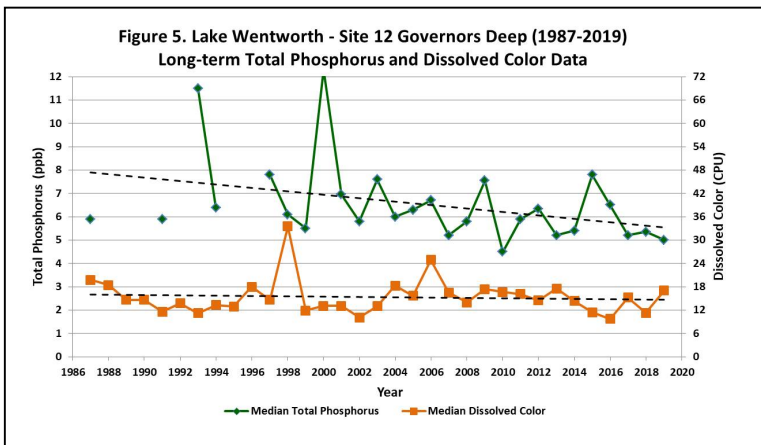
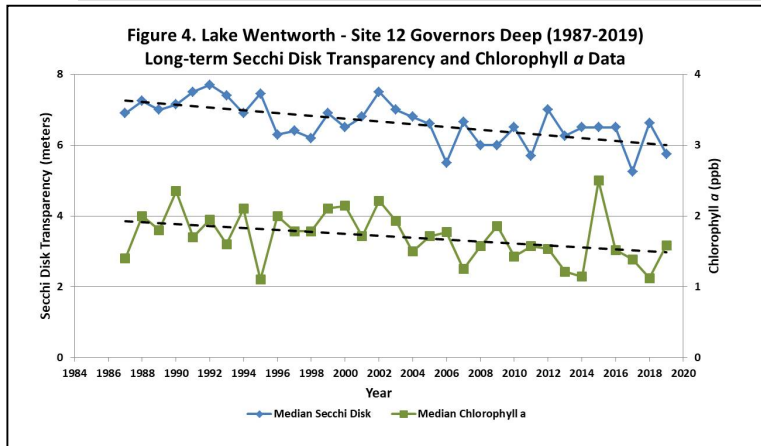


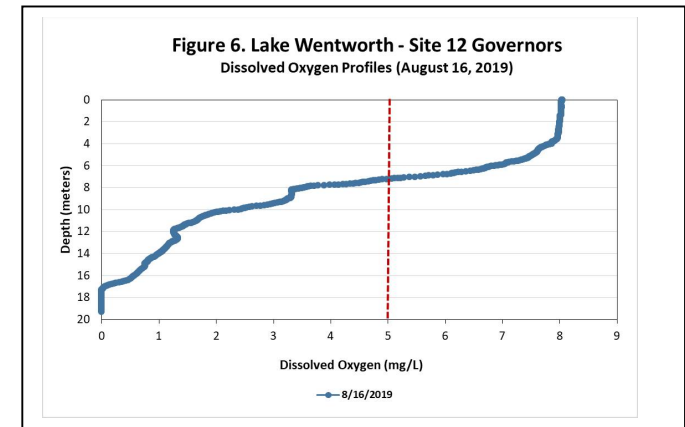
Table 3. Lake Wentworth and Crescent Lake, Site 6 Center, Seasonal Average Water Quality Inter-site Comparison (2019)

Sampling Station	Average (range) Secchi Disk Depth (meters)	Average (range) Total Phosphorus (ppb)	Average (range) Chlorophyll <i>a</i> (ppb)	Average (range) Dissolved Color (CPU)
Crescent Lake	* 5.1 m (4.5 – 5.8)	5.9 ppb (4.3 – 7.5)	1.7 ppb (0.4 – 2.6)	16.8 CPU (13.0 – 21.5)
1 Fuller	6.4 m (5.5 – 7.5)	6.4 ppb (4.4 – 10.8)	1.3 ppb (0.9 – 2.0)	17.7 CPU (9.3 – 23.7)
2 Triggs	6.4 m (5.5 – 7.0)	6.7 ppb (single sample)	1.8 ppb (1.3 – 2.8)	15.5 CPU (10.7 – 24.6)
12 Governors	5.9 m (5.0 – 7.1)	5.0 ppb (single sample)	1.5 ppb (0.7 – 2.0)	14.9 CPU (10.7 – 17.9)

* indicates the Secchi disk occasionally reached the lake bottom before disappearing from view.

Figures 4 and 5. Changes in the Lake Wentworth water clarity (Secchi Disk depth), chlorophyll *a*, dissolved color and total phosphorus concentrations measured between 1987 and 2019. **These data illustrate the relationship among plant growth, water color and water clarity. Total phosphorus data are also displayed and are oftentimes correlated with the amount of plant growth.** Long-term trends are based on the analysis of annual median values.

Figure 6. Lake Wentworth dissolved oxygen profile collected on August 16, 2019. The vertical red line indicates the dissolved oxygen concentration commonly considered the threshold for successful growth and reproduction of cold water fish such trout and salmon. *Notice the decreasing dissolved oxygen concentrations near the lake bottom.*



Recommendations

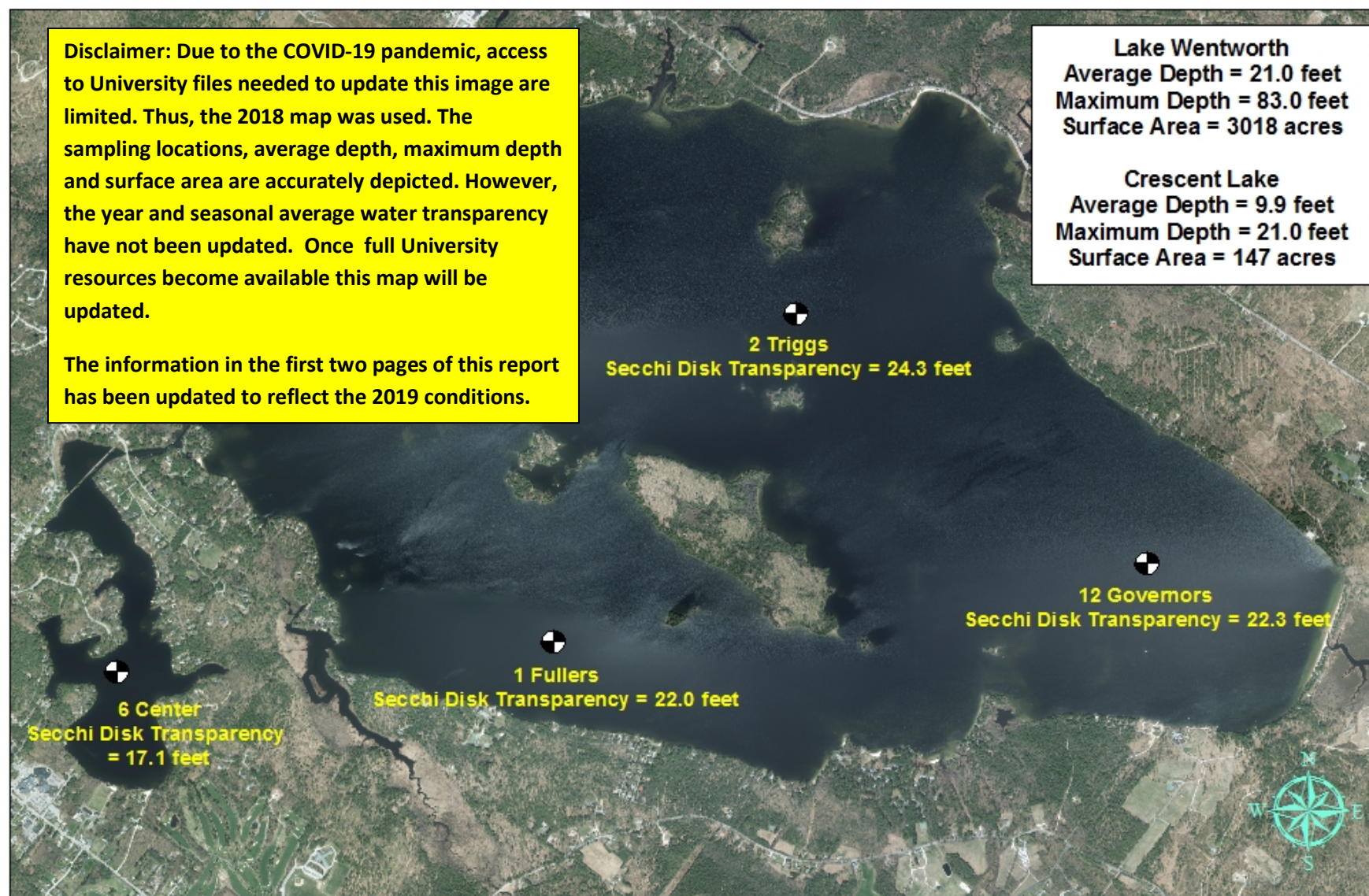
Implement Best Management Practices within the Lake Wentworth watershed to minimize the adverse impacts of polluted runoff and erosion into Lake Wentworth. Refer to “Landscaping at the Water’s Edge: An Ecological Approach” and “New Hampshire Homeowner’s Guide to Stormwater Management: Do-It-Yourself Stormwater Solutions for Your Home” for more information on how to reduce nutrient loading caused by overland run-off.

- <https://www.des.nh.gov/organization/commissioner/pip/publications/wd/documents/wd-11-11.pdf>
- https://extension.unh.edu/resources/files/Resource004159_Rep5940.pdf

Figure 7. Lake Wentworth and Crescent Lake

Wolfeboro, NH

2018 Deep water sampling site locations with seasonal average water clarity



Site location GPS coordinates were collected by the UNH Center for Freshwater Biology
Aerial Orthophoto Source: 2015 Statewide High Resolution Aerial Photography, NH GRANIT



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